DETAILED SPECIFICATIONS
COLD WATER METERS - COMPOUND TYPE
MAGNETICALLY DRIVEN
WITH ITRON ENCODER RECEIVER TRANSMITTER (ERT) AND
RADIO FREQUENCY METER READING SYSTEM

Section 1 - Scope

This specification covers compound type cold water meters in sizes 2” thru 6”. The Compound meters shall consist of a combination of an AWWA Class II turbine meter for measuring high rates of flow and a nutating disc type positive displacement meter for measuring low rates of flow enclosed in a single maincase. An automatic, spring-loaded valve shall open at high flow rate conditions permitting flow through the turbine meter. Meters must conform to latest revision of AWWA C702.

Section 2 – Operating and Physical characteristics

Operating characteristics of the meters shall exceed AWWA minimum standards as detailed in Table 1 in each of the following areas:

- Normal operating range
- Maximum Loss at maximum flow
- Maximum continuous flow
- Maximum Capacity
- Extended Low flow accuracy

Maincases shall be flanged. The 2" size shall have optional oval flanges or round flanges per Table 4, AWWA C702. The 3" through 6" sizes shall be round flanged per Table 4, AWWA C702.

The maincase and cover shall be sand cast of water works bronze containing not less than 75% copper or the low-lead alloy Envirobrass II. The size, model, manufacturer's trademark, and arrows indicating direction of flow shall be cast in raised characters on the sides of the maincase.

An NPT test plug shall be located on the maincase cover for the purpose of field-testing the meter. The maincase shall have a single 3/4" NPT drain plug located on the maincase near the outlet end of the meter casing.

The meter serial number shall be imprinted on the meter flange or cover as well as the register box covers.

The turbine measuring assembly shall be a self-contained unit, attached to the housing for easy field removal. The turbine spindles shall be stainless steel. The rotor shall balance or "float" between the turbine spindles throughout the typical operating range of the meter.

The nutating disc chamber shall be a self-contained unit mounted in a separate cover plate, attached to the housing for easy field removal. It shall conform to AWWA Standard C-700 for the following sizes: 2" and 3" - 5/8" disc chamber assembly; 4" and 6" - 3/4" disc chamber assembly.

The automatic valve shall be of the spring-loaded, poppet type. All valve parts shall be made of stainless steel or a suitable polymer with a semi-hard rubber seat. Only the low flow cover assembly must be removed to gain access to the valve for inspection or service. Once the cover is removed, the valve must be able to be removed as a complete assembly for field replacement or service as may be appropriate without the use of any special tools.

A strainer shall be provided for the disc chamber assembly. It shall be easily removable and have an effective straining area of at least double the disc meter inlet.

Casing bolts shall be made of type 316 stainless steel.

Section 3 – Meter Warranties

All meters shall carry the following published warranties:

All 2 inch through 6 inch compound meters shall be guaranteed to be free from defects in materials and workmanship for 12 months after shipment, and to meet or exceed AWWA C702-92 meter accuracy standards for a period of 12 months from the date of shipment.

Registration accuracy over the normal operating range shall be 98.5% to 101.5%.

Registration accuracy at the crossover shall not be less than 97% for 2", 3" and 4" sizes and no less than 95% for the 6" size. Registration accuracy at the low flow rate shall not be less than 95%.

Bronze meter housings shall be warranted to maintain their structural integrity for a period of 12 months from the date of shipment.

Section 4 – Registers

4.1 Straight Read and Electronic Encoder Registers (EER)

All meters shall permit the use of either a straight reading, permanently sealed local register or an electronic encoder register for connection to an automatic or automated meter reading system.

The register shall not be in contact with the water being measured.

The register devices shall be so designed to permit removal and exchange without removal of the meter from the service installation or interruption of service water supply.

Registers shall be of the center sweep test hand type that covers the entire dial face and a totalizing odometer.

The register shall be equipped with a separate low flow indicator for detecting small rates of flow, and shall display it in blue for Cubic Feet.

The meter size, model designation, and unit of registration (cubic feet), shall be clearly designated on the dial face.

The register must come equipped with a lid that covers the entire roll sealed, domed glass lens register, factory stamped with the meter serial number.

Registers shall be connected to the main case of the meter through the use of a security screw (torx) requiring a special tool for removal not readily availabe in the market place.

The register housing shall be thermoplastic or as an option, bronze register shrouds and lids shall be available for the straight-reading registers.

4.2 Electronic Encoder Register (EER) – Additional Requirements

The digital output of the encoder is equal to 1/10 of the quantity indicated by a single revolution of the test hand.

The register must be factory pre-wired to integrally mounted AMR devices requiring no wiring in the field.

The EER shall be encased in a housing which shall be a scratch resistant glass lens and a non-corrosive metal bottom. No plastic register lens or bottom are allowed.

The EER must be permanently sealed to provide moisture resistance to flooded pit or submerged conditions. The permanent seal between the glass lens and copper (metal) bottom shall utilize an adhesive seal without the use of gaskets.
Absolutely no gasketed seals or oil-filled encoder registers shall be accepted.

The EER must not be able to turn backwards.

The EER must have a low profile consistant with a straight read register of approximately 2”.
All wiring must be through the back of the register to reduce overall EER height.

As an option, a separate, field replaceable summing device shall provide a single incremental digital output signal to the radio frequency reading system ERT.

4.3 Warranties

All straight reading register assemblies for the low flow registration (disc measuring element) shall be guaranteed for a period of twenty-five (25) years from the date of shipment.

All straight reading register assemblies for the high flow registration (turbine measuring element) shall be guaranteed for a period of five (5) years from the date of shipment.

All digital and absolute encoder registers shall be guaranteed for a period of ten (10) years from date of shipment.

Section 5 – Itron ERTs

All Itron ERTs shall come pre-programmed and ready for immediate installation.
ERTs shall come with necessary mounting hardware to include a mounting bracket for the appropriate size meter box or vault.

Section 6 – Reclaimed Water Meter Option

All compound meters shall also be available for reclaimed water service applications, with operating characteristics listed in Table 1.

All reclaimed meters will have SS bolts and bronze housings marked “Reclaimed” Meters.

Both straight reading and EER registers will include lavendar plastic shroud and lid marked with the international non-potable drinking water symbol, lavendar register face marked “Reclaimed”, Torx seal screw and cubic foot registration.

Section 7 – Customer Service and Technical Support

7.1 Customer Service

Supplier will have a fully stocked warehouse within approximately 100 miles to supply the City with required product in a timely fashion.

Standard shipments shall be made at the supplier’s expense, FOB destination. Freight charges for emergency or rush orders shall be negotiated on a case by case basis.

Standard payment terms shall be Net 30 days.

7.2 Technical Support

Supplier will employ a technical support specialist with experience in supporting an Itron radio read system. This shall include knowledge and experience with the City’s utility billing system and its interface with Itron’s route management software, handheld and mobile operations, field installations and system trouble shooting.

This specialist shall be available as a first-line response, providing on-site local support for any technical issues that may arise from time to time including training or re-training of City staff in the effective use of their Itron meter reading system.

Table 1

		Badger Recordall Compound Series	AWWA Standards
HOUSING		**Bronze**	**Bronze**
LAYING LENGTH	**2"**	**15-1/4"**	**29" (Max.)**
Round Flanges unless noted	**3"**	**17"**	**38" (Max.)**
	4"	**20"**	**40" (Max.)**
	6"	**24"**	**52" (Max.)**
Width / Height	**2"**	**7-3/8" / 5-7/8"**	**- -**
	3"	**9-1/4" / 6-5/8"**	**- -**
	4"	**9-1/8" / 7-1/4"**	**- -**
	6"	**12-3/8" / 8-7/8"**	**- -**
OPERATING ACCURACY	**2"**	**1/2-200 GPM**	**2-160 GPM**
Normal Test Flow Rate Limits	**3"**	**1/2-450 GPM**	**4-320 GPM**
	4"	**3/4-1000 GPM**	**6-500 GPM**
	6"	**3/4-2000 GPM**	**10-1000 GPM**
Maximum Continuous Flow	**2"**	**170 GPM**	**80 GPM**
	3"	**400 GPM**	**160 GPM**
	4"	**800 GPM**	**250 GPM**
	6"	**1500 GPM**	**500 GPM**
Pressure Loss @ Maximum	**2"**	**5.4 PSI**	**20 PSI**
AWWA Maximum	**3"**	**5.3 PSI**	**20 PSI**
Continuous Flow	**4"**	**8.2 PSI**	**20 PSI**
	6"	**8.0 PSI**	**20 PSI**
Accuracy at Low Flow (95%)	**2"**	**1/4 GPM**	**1/4 GPM**
	3"	**1/4 GPM**	**1/2 GPM**
	4"	**3/8 GPM**	**3/4 GPM**
	6"	**3/8 GPM**	**1-1/2 GPM**